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# Participatory Design Theory

USING TECHNOLOGY AND SOCIAL MEDIA  
TO FOSTER CIVIC ENGAGEMENT



ROUTLEDGE RESEARCH IN PLANNING AND URBAN DESIGN



## Modeling, civic empowerment and the invention of a new profession

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### Introduction

Urban sprawl in Europe results in an average yearly land take of 1,000 square kilometres (European Environment Agency 2016 – EU 28 + 4 countries). A surface equivalent to Belgium is expected to be artificialized within the next 20 years, as urban sprawl increases rapidly from one decade to another. The major share of single family houses in dwelling production all over Europe in the last decades has intensified the housing contribution to land consumption. Indeed, more than half of EU households live in single family houses (Eurostat 2009).

Despite several government planning policies, urban sprawl has neither stopped nor reached its climax. Is it possible to put a complete stop to residential land consumption within the next few years? By building on citizen rather than state initiative, may urban sprawl be radically challenged?

Citizen initiatives have been increasingly influencing public policies, marking a significant shift, from centralized, government-based, to decentralized decision-making structures (Hooghe, Marks 2001), generally referred to with the term “governance” (Kooiman 1993). More and more diffuse policymaking structures and processes, interspersed across subnational, national and supranational levels of government, develop interactions with a diversity of societal actors.

In this context, Northern European countries, known for their collaborative policymaking, long-term planning, and innovative environmental policies, experiment successful “transition management” governance at both individual and collective level (Rotmans, Kemp, van Asselt 2001). Other European initiatives advocate for small incremental innovations, repeated and used by a great many, to transform the way cities are built and lived. Part of these initiatives – referred to as “massive small” – states that top-down policies should support incremental bottom-up initiatives setting up conditions in which the creative force of people leads them to shape and manage collaboratively their living environment (Campbell 2011). Regardless of their respective forms, these initiatives introduce a radical break from dominant approaches. Theorized by Heifetz and Laurie as “adaptive changes”, they have been developed by citizens to answer shared concerns over societal issues by building on collective processes, redefining productive norms, and tasks, thus improving the resilience of local communities (Heifetz, Laurie 1997).

In France, despite consensus on bottom-up governance’s virtues, several authors have pointed out the limits of empowerment processes (Blanc, Emelianoff 2008; Nez 2011) while others propose to improve them (Callon, Barthes, Lascoumes 2009). In this context, a recent initiative, addressing directly urban sprawl by way of “massive small” processes involving both citizens and local governments, arose first as a research project, then as blooming experiments all over the country.

Born from a research project carried on between 2009 and 2012,<sup>1</sup> BIMBY (“Build In My Backyard”<sup>2</sup>) is currently an open source initiative aiming to design, build, and collectively organize a new supply chain for housing production. This alternative takes place within existing neighbourhoods, accommodating new dwellings in the many private yards and gardens produced during decades of urban sprawl.

Since 2013, BIMBY has been experimented and developed by professionals from many fields, committed to support the emergence of willing homeowners, then to coach them through the transformation or adaptation projects of their estate. Part of these projects result in the building of new housings in their gardens or backyards, thus directly targeting the formulation and validation of a new pragmatic, “soft” (i.e. low-density) and collaborative solution to urban sprawl (Le Foll, Miet 2013). Using a new generation of 3D modeling tools – allowing fast and smooth sketching – teams of architects, urban planners and designers

involved in BIMBY processes have introduced a new perspective on the question of technology as a mean to foster civic contribution in the transformation of existing neighbourhoods.

BIMBY central hypothesis meets one developed earlier by C. Alexander (1979) and K. Lynch (1981), according to which architectural modeling could and should be a major tool for citizen empowerment in urban renewal projects, by easing comprehension and giving access to collective deliberation for a wider community. Does the utilization of a sophisticated technological tool, within participative urbanism processes, maintain the power to transform the built environment in the hands of professional bodies or, on the contrary, does it open for homeowners new ways to commit in their neighbourhood's evolutions?

After a closer look at the assets and potentials of the BIMBY process in addressing urban sprawl, a detour by transition theories will help us to see how BIMBY may function as a transition tool. Then a descriptive analysis of BIMBY one-to-one "design dates" protocol will lead to an examination of the roles played by both homeowners, professionals and the modeling tool. The relevance of the modeling tool will be assessed in the perspective of repositioning and empowering single-family homeowners in the transformation of their built environment. Finally, by showing how "BIMBY taKe off Officers" (bKO's) give inhabitants a safe access to a new kind of "space", opening countless transformation options for their own properties, we will underline the skills acquired and developed by these professionals. This could explain how giving back to homeowners a significant level of control on the transformation of their own property may contribute to a radical step in tackling urban sprawl.

## **BIMBY: a transition tool to counter urban sprawl?**

### ***Sparing land resource without owning it***

Considering both urban sprawl and the difficulty of evolving existing neighbourhoods with traditional planning tools, the BIMBY concept proceeded from the research of a soft densification process implementable

without direct control of land resource. It was designed as a way to accommodate new residential units in the gardens of already developed areas of single-family dwellings with no need of public or private developer to buy and replace existing low-density homes by higher density ones (Le Foll, Miet 2013).

The research arose from two straightforward facts: in the first place, a household owning a detached house can earn significant money by selling part of its plot to another household with only a marginal depreciation of the first house. The closer a given house is to the city centre, the higher is the land-market value of its garden, and the less the existing house value will be impacted by the diminution of its garden. In other words: the more relevant the BIMBY process is, the more homeowners will have interest in the densification of their own plots. In the second place, the household buying this spare piece of garden, which will build a house for itself, will get it at drastically lower costs (land and construction) compared to buying the same one in a contractor development programme (Castel 2007).

Hence the formulation of the initial BIMBY project hypothesis: a huge land resource is available, mostly in the gardens of last decades' urban sprawl, which may be tapped to produce affordable and well located new houses, by helping owners to divide and sell part of their gardens to future neighbours. Therefore, early BIMBY experimentations reinstated urbanism as a real and direct service offered to the inhabitant, with BIMBY officers subsidized by local governments and available for free to help willing homeowners design and realize their projects.

France registered a production of 166,100 single family houses in the last 12 months (INSEE 2017). The last known stock for single family houses in France amounts to 19.35 million units. Thus, if each year one out of every hundred homeowners (regardless of occupancy status) engages in a project resulting in the construction of one or more new houses on an already built plot, the number of new single-family dwellings produced would match the entire production, without any land consumption.

The perspective opened by the BIMBY research programme is clearly to put a complete stop to residential land consumption, as urban sprawl has become a major concern for all European countries (European Environment Agency 2016). Therefore, by building on citizen, rather than state, initiative, urban sprawl might be radically challenged.



## *A protocol envisioning transition*

Since 2013, 3,000 households have taken part in BIMBY protocols tested on a wide range of territories, from 1,500 inhabitants' villages to 30,000 inhabitants' towns, from 95,000 inhabitants' urban areas to regional clusters associating several dozens of cities tallying more than 150,000 inhabitants. These experiments provide the backbone for a global research project. Lab InVivo<sup>3</sup> endeavours in this field have been supported by national and European partners such as academics, local governments and operational bodies through several research programmes (JPI, SMART ERA NET, FEDER, ANR, ADEME, ENSA Marseille, Lab Project . . .).

The BIMBY process is structured in two stages. The "futuring stage" consists in assessing the potential for BIMBY densification, defining an urban and housing production strategy, organizing workshops with inhabitants to figure out their willingness to engage in a plot densification process, and redesigning zoning rules according to models developed with participants. Then, the "performing stage" consists in helping out willing households to achieve their BIMBY projects.<sup>4</sup>

The participative protocol within the futuring stage has been designed as massive sessions of one-to-one "design dates" where homeowners meet BIMBY officers, ushering them through a journey during which they discover, step by step, in 3D, many possibilities to transform their property. By looking with new eyes at their house, their plot and, most of the time, their life, they may envision this odd idea of welcoming a new neighbour in their own garden! The "design date" protocol is based on modeling, in the sense of the design of symbolic constructions that enable reasoning on action projects within a complex system, anticipating, by deliberation, their consequences (Le Moigne 1994).

Indeed, since the early 2000s, original modeling possibilities have been opened in the fields of architecture and urbanism by the emergence of 3D modeling software allowing quick sketching and simulations. Requiring a full set of both architectural and computer skills, 3D architecture modeling software may appear, at first sight, as dedicated to professional environment, in line with the rather technicist, function and form-oriented approach of architecture and urbanism that prevailed over the twentieth century.<sup>5</sup>

However, BIMBY officers involved in one-to-one "design dates" use their mastery of 3D fast modeling techniques to engage homeowners with live visualizations of several possible ways to transform any given property, thus opening a new kind of space. The results of hundreds of collaborative sessions held from 2013 to this day bring out the confirmation that gardens and backyards actually provide a massive land resource for housing production and redevelopment of low-density urban fabrics (Vigneron 2016; Andréault 2017).

With more than 60 local governments involved in BIMBY programmes, and expecting both research and operational outcomes, the concept is still in development and has yet to enter its fully operational stage. Until now, BIMBY may be referred to as "innovative experimentation". From the transition theory point of view (Kemp 2007; Loorbach 2010; Rotmans et al. 2001; Markard, Truffer 2008), BIMBY may appear as a "niche" (Geels, Schot 2007). However, the rising number of experimentations all over France calls to envision a new stage of development.

According to Geels and Schot (2007, p401), transitioning from niche innovation to a change of sociotechnical regime requires three steps: incubation, experimentation, and learning process. The rising number of experimentations implies a focus on the learning process, since knowledge has to be structured to train a growing pool of new officers. The perspective is the role of all BIMBY officers as niche activators to transform mainstream pathways. "BIMBY take off Officers" (bKO) provide a good example of this process. bKOs are in charge of the first interactions with homeowners and strive to empower them through co-design techniques.

## **The invention of a new profession to activate the BIMBY potential**

To understand the link between bKOs positioning and civic empowerment, it is useful to emphasize the bottom-up principles of the process, and then describe the capacities developed by these professionals to give back to inhabitants a significant level of control on the transformation of their own property, and, therefore, in the building of contemporary cities.

With an example, chosen among some 3,000 BIMBY "design dates"

completed so far, we will explain how bKOs step in upstream from usual architectural process. They must help ideas emerge from inhabitant's life stories and needs, and then envision projects that could result in new housing creation, however counterintuitive it may seem.

All "design dates", when held for the first time, follow the same precise framework (Figure 9.2 step 1). The household can benefit from bKO's skills during a one-hour slot. The 3D model is handled as a medium for interaction, and the discussion smoothly follows the needs, concerns, expectations and aspirations expressed by inhabitants until "something special" happens.

### *Taking off: what happens on a "one-to-one design date"?*

The setup for a "design date" adopts a space disposition that breaks from standard meetings with counsellors, consultants or professional third parties. Traditionally, both parties are face to face. During BIMBY design dates, inhabitants and architects sit side by side, both facing the screen where action will take place (Figure 9.1). When several persons take part in the session (couple, family with kids, sometimes a family group or a bunch of neighbours), people sit both sides of the bKO.

The workshop begins by facing a blank screen devoid of any element prepared in advance, for the inhabitants to understand that neither the bKO nor public authorities hosting the experiment have any ideas or preconceptions of any kind on the future of their private own plot (Figure 9.2 – step 2). The household does not come to discover the presentation of a project the bKO has designed for them. They come to embark on a journey during which zoning rules are temporarily set apart, easing a direct and deep dive into their needs, questions, concerns and dreams.

The bKO begins by asking for the household's address, and then switching on satellite views of the neighbourhood. Once the plot is outlined with the help of participants, a 3D model layout of the existing house and existing buildings close to it is set up (Figure 9.2 – steps 2, 3, 4).



Figure 9.1 A "design date"  
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Before the actual "take-off", the bKO gathers momentum by asking the inhabitants to express, click by click, an accurate knowledge of their house, their garden, the position of the tree, the entrance . . . Thus, the officer manages to set up, incrementally, both the 3D model on the screen and a shared mental model that emerges through the discussion. The small-time lag between the inputs coming from the inhabitant, and the slight and continuous adjustments performed to the model by the bKO, install the inhabitants in a quite comfortable overseeing position that lets them, progressively, take control of the mental model being worked on and give the next instructions to the professional. Very soon, they feel immersed, in an "intimacy triangle" between the architectural model on the screen, and the professional skilfully handling it according to their inputs and his/her own knowledge.

As the inhabitants follow the 3D model progression, they feel free to develop, spontaneously, or with some subtle cues from the bKO, their concerns, ideas and directions. At the same time, the proficiency demonstrated by the professional when fast drawing a three-dimensional model of the plot, existing buildings, accesses and slope, conveys to the household a feeling of confidence and power.

Some households "take off" at once, from the simple drawing of existing elements, to the sudden drawing of new elements that totally reconfigure their own property and way of life, while the 3D model is yet still

schematic. Others need more time and a more detailed 3D model to feel sufficiently at ease to carry on and let the bKO embark with them to explore the opportunities of their estate.

On the “initial climb” (Figure 9.2 – step 5) the bKO continues to add both existing and new elements such as fencing, trees, drop shadows, accesses, carport and new constructions. Every element is positioned by questions and answers. Each household leads the bKO to bring up a different range of questioning according to their situation and concerns. In the case of the “design date” illustrated below, the household came without any pre-existing project. Eventually, the question of car parking functioned as a trigger . . .

Once the model of the existing situation is completed (Figure 9.2 – step 7), the husband suddenly explains that his car is parked on the street. This happens to be a recurring concern, when he comes home from a long day at work, only to find that there’s nowhere to park in the street, and that his neighbour is parked in front of their house even if he owns a private garage. Under an apparently futile pretext, the husband passes a threshold without even thinking about it: he asks the bKO to “build” something that does not yet exist on his plot, namely a garage for the couple’s car (Figure 9.2 – step 8).

Then, emboldened by how easily the garage materialized instantly on the model, the couple considers extending it with some useful storage place. And quite seamlessly the storage morphs into a small studio (Figure 9.2 – step 9).

Indeed, the couple’s daughter, 22 years old, soon to be back from the United States, where she succeeded in getting a degree, has no home nor clear prospect soon. The parents know their daughter would rather accept a nice independent studio than her former room in the attic, still papered with posters of the boy bands she was fan of at 16 . . . And the father confesses he feels that his daughter left home far too young, and that he’s looking forward to reconnecting with her.

A project building on very emotional motivation has emerged. At this point, the bKO asks the couple if they are OK with a building whose exterior walls and windows would face directly the public sidewalk on the street. The professional takes the household on a little “stroll” further up the street via Google StreetView. Together, they observe that other houses or garages are positioned slightly behind the limit between private plot and public space. In the gap, people maintain small and beautiful ornamental

gardens. Why not do the same? The bKO drags the building they just set up on the model with a few mouse clicks (Figure 9.2 – step 9). Through combined smooth handling of the software and counselling techniques, the inhabitants reach a new degree of freedom and open perspectives.

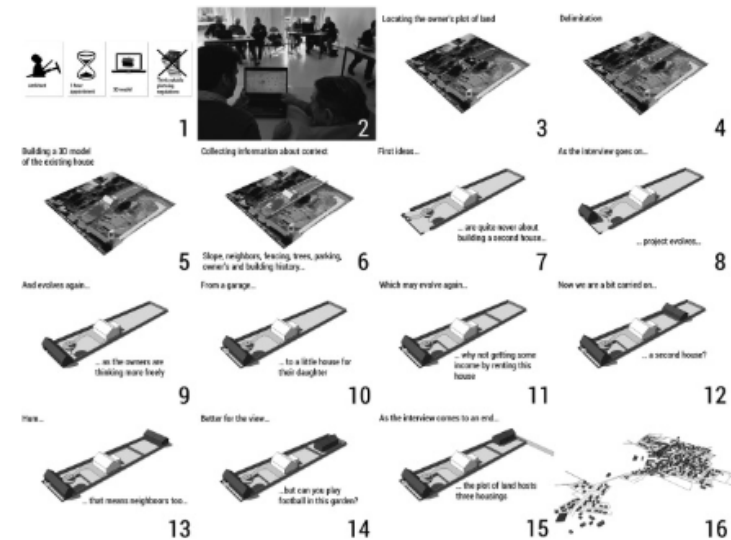


Figure 9.2 Evolutions of a model during a design date

A studio for their daughter? But for how long? The couple agrees that, anyway, she should not spend the rest of her life with them . . . May they should let this studio? Building an apartment on a plot you already own, and letting it, that is a worthwhile investment! Rather withdrawn so far, the wife takes the lead and asks the bKO to “build” a second house. She observed that rental detached houses with a garden are very scarce in the neighbourhood. The bKO immediately complies, erecting the new house on the exact spot indicated by the couple (Figure 9.2 – step 12). As the bKO displays different carefully chosen angles of view, the couple understands that even by placing the new house further from the existing one, there is little intimacy as the two houses are directly facing each other. The wife spontaneously suggests rotating the new house on a 90° angle (Figure 9.2 – step 14). But 3D visualization makes clear for everybody that the garden of the new house is now of very little use. As the wife says, the



prospective rent just dropped 20%! You cannot play football in such a garden . . . The couple happens to be good friends with one of their neighbours. They eventually ask the bKO to set the new house alongside the limit of the plot, on the side of the neighbour friend (Figure 9.2 – step 15), whom they decide to invite to the next session of BIMBY design dates. Could he undertake a similar project?

When all “design dates” are finally completed, models of all these projects born from the household’s situations, aspirations and needs are put together on a global model realized at town scale. These local inputs, once put together at neighbourhood or city scale, feed city council and urban planners’ vision, enabling them to transition to a whole new planning logic, taking into account BIMBY projects and translating them into new zoning rules. From that point, the BIMBY process enters its performing stage: BIMBY Officers work, hand in hand with other professionals, to support households up to the achievement of their BIMBY projects.

### *bKOs’ skills to activate suburban homeowners’ initiatives*

For most people, before they’ve had the opportunity to experience a “design date”, an architect blueprint or model is something totally set, on which only a pro may intervene. Basic software functions (stretch, raise, lower, move a building) lead them to an appropriation of the design process: they know very well their garden, the buildings in it, their dimensions, openings, the way the sun shines on them in spring, the way the wind blows on them in winter.

The bKO knows how to drag, stretch, raise and adjust the 3D model through quick adaptations. To bolster this logic of creation and visualization, the professional keeps the model moving, slightly changing angles and perspectives to convey the feeling that the project may continuously and effortlessly evolve and adapt. Andréault’s research work shows that at the end of the sessions, many households recount that they felt both surprised and exhilarated by the process (Andréault 2017).

Beyond architecture and facilitation, the bKO acts as a transition activator. This position implies multi-field knowledge and competence, and the ability to articulate them through local models of understanding. On a case-by-case basis, bKOs introduce a new form of political culture that gives back to the inhabitants their share in a collective project: the

transformation of existing neighbourhoods. The bKO stirs up initiatives that in most cases may not have emerged without their intervention (Andréault 2017).

Scaling up this function opens new perspectives for local governments to take action and sustain their demographic growth with new households supplied on already built plots. BIMBY officers articulate a cogenerated process in which homeowners’ input completes classical territorial analysis thanks to a more intimate form of interaction that allows a broader sharing of knowledge than with conventional participation protocols. In many cases, when design dates are organized aside standard participation sessions, affluence is bigger for design dates, with a richer feedback for local governments and planners. The massive sessions of design dates (from 80 to 200 and more households, depending on the size of the community and the framework imparted by local government) feed the evolution of local zoning rules. Models produced make outstanding test beds to design morphological-based planning ordinances and sketch guidelines for the evolution of suburban areas. The BIMBY process empowers homeowners through the collaborative elaboration of an evolution model of their own property. Meanwhile, it enables local authorities to adjust the production of new houses thanks to reformulated form-based ordinances.

The core of the process lies on reinstatement:

- individual reinstatement of households in full capacity of their ownership: what better way to assert themselves in their prerogatives as owners than by acquiring the capabilities to bring sound transformation to their assets and/or to earn from them;
- collective reinstatement of suburban homeowners in their quality of major stakeholders in land use and city manufacturing. Reinstatement of zoning rules as a framework to be utilized by citizens from all parts of the city, and not only by developers and “big players”;
- reinstatement of the suburbs as a living part of the city able to develop, transform and match the expectations of both existing and new inhabitants.

The art of modeling as practised by bKO opens a new field in architecture processes and professions. It does not take place in a process of architectural creation in response to a command. Modeling, prior to any

command, empowers inhabitants in being, at their plot level, contracting authorities with full control, within the framework of zoning rules.

Beyond architectural level, this modeling is part of a logic including a more complex socio-technical system into which land resource, real estate, family inheritance logics, mediation with family or neighbours, technical constraints, sense of belonging, interact. BIMBY modeling, by itself and as a support for interaction between homeowners and the bKO, becomes a tool helping the household to visualize all the elements of the global and local system into which its project develops. The growing confidence felt by the inhabitant is neither self-confidence nor confidence in the bKO: the confidence lies in the model collaboratively designed.

In France, architecture as an academic discipline remains essentially related to the "Beaux-Arts" tradition (Cohen, Devisme 2018). Architectural design, although inspired by household needs, location context and constraints, stays above circumstantial specifications, with the main statute of an artwork. By contrast, BIMBY deals with processes that remain entirely in the inhabitant's control. BIMBY protocols have been designed to deliver knowledge and explanations enabling the household to take control of the model built with the bKO. Beyond design, the model proceeds from the specific context of the plot, but also takes place in a global strategy of land supply management, introducing at the same time the principle of an incremental, tailor-made urbanism, as design dates are incremented at neighbourhood or city scale.

This shift in architectural practice requires higher standards of competency and empathy for the operators involved. The intensity of the one-hour slot, the need to be responsive and ready to explore many alternative paths, in stride with homeowners' options, and to maintain constant progress and deliver tangible results in relation with the household life circumstances, implies multifaceted knowledge and skills. Above all, the BIMBY process gives up on the romantic vision of architecture to adopt a more pragmatic stance.

Experience shows that these higher standards are required to give inhabitants confidence in their capabilities to transform their land plot. By interacting with the bKO, homeowners realize that they have an extensive, precise knowledge, useful to achieve a desired outcome, building on both their individual projects and on the contribution of these individual projects to the collective future of their cities.

With progressive implementation of BIMBY processes, another

significant shift of paradigm appears, as participant households take charge of the better part of their gardens' evolution, and by extension, of their cities' transformation. Through the model, an extended set of variables may be coordinated in a much more complex system than the basic equation between the physical constraints of a given lot and a given family situation. The model opens and secures leeway, by explaining the ins and outs of the project, which therefore are no more ignored, or identified as threats, and become levers actionable by the household to improve and adapt the project.

This momentum aimed at by many participatory processes – when participants "get it" or "see it clearly" – is sometimes described as "a kind of magic" (Roggema 2014, p11). However, early research described this tipping point as the result of the flexibility of processes and the capacity to muster instantly expertise in answer to a given problem (Lawrence, Lorsch 1967). More recent research shows that intuition is also a key. Processed automatically and without conscious awareness, intuition is mostly provided through knowledge acquired by associative learning (Plessner, Betsch 2008, p4). A BIMBY "design date" combines indeed flexibility, instant multi-field expertise, and associative learning, enabling the participant to feel ready to act once the model is set up.

Thus, the inhabitant transitions from its usual status as "owner", "user" or "applicant" to a more practical role as s/he takes part in the design and the production of the contemporary city. By cumulating these complementary roles, s/he has more leverage and therefore is more prone to be taken into account by local governments.

## Conclusion:

Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody.

(Jacobs, 1961, p238)

When, over 2 to 6 days, groups of bKOs are running 80 to 200 and more design dates with willing households coming to meet them in town halls, libraries, public buildings, the promise given lies in a very open message: one hour for free to have a good think about their house and its plot, and to



check all possibilities to make them evolve according to their needs and desires. The outcome of these protocols varies from 0.5% to 20% of single family house homeowners coming on a design date. However, the proportion of participants to design dates having the bKO sketching a project resulting in the production of one or more residential units on their plot is very stable at 60%, wherever design dates are held, most of them short-term projects (Andréault 2017).

From BIMBY design date to the actual building of a second house in a plot already hosting an existing one, the journey is obviously a difficult one, with many hurdles (family decision making, financing, rule compliance, choosing the right professionals, managing the neighbourhood . . .) even with the support of teams of BIMBY Officers. Nonetheless, European statistics demonstrate that with only 1% or less of single-family dwellings owners engaging each year, for whatever reason, in the building of a second residential unit on their plot, or in selling for residential construction part of this plot (and being able to do this according to zoning rules), the entire production of single family dwellings could be relocated in already developed areas, closer to urban centres. This is statistically true in each of the EU 28 countries.

Access to land resources in the heart of urban areas is decisive to answer the call for attractive, affordable, plentiful housing, close to employment and amenities, and stop urban sprawl. Shifting governance balance, by reinstating homeowners in their full capacity to develop projects on their plots, is an appealing way to trigger the release of land resources meeting the needs of many kind of households, not least elderly people and families.

Modeling technology as used in the BIMBY process shows relevant potential to unlock possibilities and set households in motion. Based on multifaceted skills, empathy, collaborative pedagogy, the bKO role and the modeling protocol offer a robust solution building on the owners of single-family dwellings to contribute to the end of urban sprawl. The capacity for BIMBY processes to foster civic engagement depends, above all on the way both professional and homeowners put this technology into use when interacting together with the model. The incrementation of the process, required to address urban sprawl and evolve existing neighbourhoods, calls for a rise in new professions building on technology as a means to reinstate homeowners in their full capacities, at both individual and community level.

## Notes

- 1 Funded by the French Agence Nationale de la Recherche (ANR) within the “Sustainable Cities” programme.
- 2 BIMBY (Build In My Backyard) is a collective mark registered (INPI n°3983105) as an open-source collaborative systemic project. The BIMBY concept encompasses any action aiming at housing production, under the following conditions:
  - a) without urban sprawl, on plots already built, without complete demolition of existing dwellings;
  - b) initiated by the inhabitant, in an architectural and landscape approach respectful of the neighbourhood and of the local community common project;
  - c) orchestrated by local governments, in a process of territorial development federating and integrating the projects of the inhabitants;
  - d) without land speculation, with a full transparency about the inhabitant’s real estate assets’ value and enhancement potential.

3 [www.lab-invivo.eu](http://www.lab-invivo.eu)

4 This second stage will not be explored in this chapter.

5 This approach continues to underpin, for example, BIM development.

## References

- Alexander, C. , 1979. *A pattern language: Towns, buildings, construction*. Oxford University Press, New York.
- Andréault, C. , 2017. Du périurbain à l’urbain: vers la coproduction d’une ville sur mesure. L’intégration des habitants maîtres d’ouvrage d’un projet de logement sur leur terrain dans la démarche BIMBY. Université Paul Valéry Montpellier 3.

- Blanc, N., Emelianoff, C. , 2008. *L'investissement habitant des lieux et milieux de vie: une condition du renouvellement urbain?* PUCA, Paris.
- Campbell, K. , 2011. Smart urbanism: Making massive small change. *Journal of Urban Regeneration and Renewal* 4, 304–311.
- Castel, J.C. , 2007. Coûts immobiliers et arbitrages des opérateurs: un facteur explicatif de la ville diffuse, in: *Annales de La Recherche Urbaine*, pp. 102–114.
- Cohen, C., Devisme, L. , 2018. L'architecture et l'urbanisme au miroir des formations, Éditions de la Villette – Réseau RAMAU, edn, Cahiers Ramau. Paris.
- Devisch, O., Poplin, A., Sofronie, S. , 2016. The gamification of civic participation: Two experiments in improving the skills of citizens to reflect collectively on spatial issues. *Journal of Urban Technology* 23, 81–102.
- European Environment Agency, 2016. Urban sprawl in Europe (Joint EEA-FOEN report).
- Eurostat, 2009. Consumers in Europe: An extensive range of statistics on consumers: Price levels, shopping, housing and much more (No. STAT/09/95), Newrelease.
- Geels, F.W. , 2002. Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. *Research Policy* 20–31, 1257–1274.
- Geels, F.W., Schot, J. , 2007. Typology of sociotechnical transition pathways. *Research Policy* 36, 399–417.
- Heifetz, R.A., Laurie, D.L. , 1997. The work of leadership. *Harvard Business Review* 75, 124–134.
- Hooghe, L., Marks, G. , 2001. *Multi-level governance and European integration*. Rowman & Littlefield, Lanham, MD.
- INSEE, 2017. Sitadel2 – Données détaillées sur les logements: Observation et statistiques.
- Jacobs, J. , 1961. *The death and life of great American cities*. Random House, New York.
- Kemp, R. , 2007. An example of a “managed transition”: The Transformation of the waste management subsystem in the Netherlands (1960–2000), in: Lehmann-Waffenschmidt (ed.), *Innovations towards sustainability, sustainability and innovation*. Springer, Berlin, pp. 87–94.
- Kooiman, J. , 1993. *Modern governance: New government–society interactions*. Sage, London.
- Lawrence, P., Lorsch, J. , 1967. *Organization and environment: Managing differentiation and integration*. Harvard University Press, Boston, MA.
- Le Foll, B., Miet, D. , 2013. Construire dans mon jardin et résoudre la crise du logement – Métropolitiques. [Metropolitiques.eu](http://Metropolitiques.eu). [www.metropolitiques.eu/Construire-dans-mon-jardin-et.html](http://www.metropolitiques.eu/Construire-dans-mon-jardin-et.html).
- Le Moigne, J.L. , 1994. *La théorie du système général: théorie de la modélisation*. Presses universitaires de France, Paris.
- Loorbach, D. , 2010. Transition management for sustainable development: A prescriptive, complexity-based governance framework. *Governance* 23, 161–183.
- Lynch, K. , 1981. *Good city form*. MIT Press, Cambridge, MA.
- Markard, J., Truffer, B. , 2008. Technological innovation systems and the multi-level perspective: Towards an integrated framework. *Research Policy* 37, 596–615.
- Nez, H. , 2011. The limitations and potential of citizen participation in metropolitan areas: Enhancing new forms of urban and metropolitan governance. *Net-Topic/Urbact*, 9–11.
- Plessner, H., Betsch, C., Betsch, T. , 2008. *Intuition in judgment and decision making*. Lawrence Erlbaum, New York.
- Roggema, R. , 2014. *The design charrette: Ways to envision sustainable futures*. Springer Science & Business Media, Dordrecht.
- Rotmans, J., Kemp, R., Van Asselt, M. , 2001. More evolution than revolution: Transition management in public policy. *Foresight* 3, 15–31.
- Vigneron, R. , 2016. *Formes et enjeux sociotechniques du périurbain durable: comparaison de Bimby et du New Urbanism*. Sous la dir. de A. Coste et de S. Sadoux. UPMF, Grenoble.